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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,401	12/03/2003	Akihiro Yoshida	246149US2	5027

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EXAMINER	
CHEN, CHIA WEI A	

ART UNIT	PAPER NUMBER
2622	

NOTIFICATION DATE	DELIVERY MODE
01/29/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/725,401	YOSHIDA, AKIHIRO	
	Examiner	Art Unit	
	CHIA-WEI A. CHEN	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 November 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 June 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 25, 2008 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1-3 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1, 2, 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morimoto (US 6,453,124) in view of Kato (US 4,156,563), further in view of Serizawa et al. (US 6,593,970 B1).

As to claim 1, Morimoto teaches, in figure 1, a digital camera comprising:

- a range finding sensor to measure a distance to an object (distance-measuring sensor 15);
- an imaging device configured to receive an image of the object (image sensor 8);
- a focus lens configured to image the image of the object on the imaging device (taking lens 4);
- a first focusing system of obtaining a focusing position by sampling a contrast of an object image formed on a light receiving surface with moving a focus lens along an optical axis (contrast AF method; col. 15, lines 22-31);
- a second focusing system of obtaining the focusing position by measuring a distance to an object based on a triangular surveying system (phase difference AF; col. 5, lines 27-36);
- a selection device configured to select that one of the first focusing system and the second focusing system is operative or that both of the first and second focusing systems are operative together (menu setting AF selection, state S12; flowchart Fig. 7),
- wherein the first focusing system is configured to detect the focusing position by means of the imaging device (image capture or three successive frames are done by the image sensor 8; col. 13, lines 41-46),
- wherein the second focusing system is configured to detect the focusing position by means of the range finding sensor (col. 5, lines 22-31);

but does not teach:

- wherein the second focusing system obtains the focusing position by measuring a distance to an object with the range finding sensor based on a triangular surveying system without using the focus lens;
- an edge enhancement processing device configured to emphasize an edge component of an image signal of a photographed image obtained by photographing said object;
- a system control unit having a first level conversion characteristic in which a predetermined gain setting value is set and a second level conversion characteristic in which a gain setting value larger than the gain setting value of the first level conversion characteristic is set,
- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement processing device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized.

Kato teaches wherein:

- a focusing system (Fig. 1) obtains the focusing position by measuring a distance to an object with the range finding sensor based on a triangular surveying system without using the focus lens (Kato detects focus using lenses 16 and 17 instead of main lens 24).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the focusing system of Kato with the second focusing system of Morimoto in order to provide a focusing system that can overcome the difficulties of low contrast and complex scenes. (See col. 1, lines 24-30 and col. 2, lines 14-34 of Kato.)

Kato in view of Morimoto does not teach:

- an edge enhancement processing device configured to emphasize an edge component of an image signal of a photographed image obtained by photographing said object;
- a system control unit having a first level conversion characteristic in which a predetermined gain setting value is set and a second level conversion characteristic in which a gain setting value larger than the gain setting value of the first level conversion characteristic is set,
- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement processing device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized.

Serizawa et al. teaches:

- an edge enhancement processing device (1100) configured to emphasize an edge component of an image signal of a photographed image obtained by photographing said object;
- a system control unit (edge enhancement amount control circuit 1160) having a first level conversion characteristic (coefficient of "1") in which a predetermined gain setting value is set and a second level conversion characteristic (coefficient of "2") in which a gain setting value larger than the gain setting value of the first level conversion characteristic is set (col. 11, lines 3-17), and
- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement processing device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized. (Depending on a preset exposure interval, an edge enhancement amount control signal indicates a coefficient of "1" or a coefficient of "2" to the edge enhancement multiplier; see col. 11, lines 12-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the edge enhancement processing device of Serizawa et al. with the hybrid-focus digital camera of Morimoto and Kato to expand the

dynamic range of a video signal for different image capture scenarios. Serizawa teaches the adaptation of an edge enhancement process during different conditions of photography. It would have been obvious to a person having ordinary skill in the art to have used the edge enhancement parameters with the appropriate photographing conditions to improve the dynamic range of the captured image. (See col. 1, lines 32-35 of Serizawa et al.)

As to claim 2, Morimoto teaches, in figure 1, a digital camera comprising:

- a range finding sensor to measure a distance to an object (distance-measuring sensor 15);
- an imaging device configured to receive an image of the object (image sensor 8);
- a focus lens configured to image the image of the object on the imaging device (taking lens 4);
- a first focusing system of obtaining a focusing position by sampling a contrast of an object image formed on a light receiving surface with moving a focus lens along an optical axis (contrast AF method; col. 15, lines 22-31);
- a second focusing system of obtaining the focusing position by measuring a distance to an object based on a triangular surveying system (phase difference AF; col. 5, lines 27-36);
- a selection device configured to select that one of the first focusing system and the second focusing system is operative or that both of the first and second focusing

systems are operative together (menu setting AF selection, state S12; flowchart Fig. 7),

- wherein the first focusing system is configured to detect the focusing position by means of the imaging device (image capture or three successive frames are done by the image sensor 8; col. 13, lines 41-46),
- wherein the second focusing system is configured to detect the focusing position by means of the range finding sensor (col. 5, lines 22-31);

but does not teach:

- wherein the second focusing system obtains the focusing position by measuring a distance to an object with the range finding sensor based on a triangular surveying system without using the focus lens;
- an edge enhancement processing device configured to emphasize an edge component of an image signal of a photographed image obtained by photographing said object,
- a system control unit having a first level conversion characteristic in which a predetermined limit setting value is set and a second level conversion characteristic in which a limit setting value larger than the limit setting value of the first level conversion characteristic is set,
- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and

sends the second level conversion characteristic to the edge enhancement processing device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized.

Kato teaches wherein:

- a focusing system (Fig. 1) obtains the focusing position by measuring a distance to an object with the range finding sensor based on a triangular surveying system without using the focus lens (Kato detects focus using lenses 16 and 17 instead of main lens 24).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the focusing system of Kato with the second focusing system of Morimoto in order to provide a focusing system that can overcome the difficulties of low contrast and complex scenes. (See col. 1, lines 24-30 and col. 2, lines 14-34 of Kato.)

Kato does not teach:

- an edge enhancement processing device configured to emphasize an edge component of an image signal of a photographed image obtained by photographing said object;
- a system control unit having a first level conversion characteristic in which a predetermined gain setting value is set and a second level conversion characteristic in which a gain setting value larger than the gain setting value of the first level conversion characteristic is set,

- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement processing device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized.

Serizawa et al. teaches:

- an edge enhancement processing device (1100) configured to emphasize an edge component of an image signal of a photographed image obtained by photographing said object;
- a system control unit (edge enhancement amount control circuit 1160) having a first level conversion characteristic (coefficient of "1") in which a predetermined gain setting value is set and a second level conversion characteristic (coefficient of "2") in which a gain setting value larger than the gain setting value of the first level conversion characteristic is set (col. 11, lines 3-17), and
- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement

processing device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized. (Depending on a preset exposure interval, an edge enhancement amount control signal indicates a coefficient of "1" or a coefficient of "2" to the edge enhancement multiplier; see col. 11, lines 12-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the edge enhancement processing device of Serizawa et al. with the hybrid-focus digital camera of Morimoto to expand the dynamic range of a video signal for different image capture scenarios. Serizawa teaches the adaptation of an edge enhancement process during different conditions of photography. It would have been obvious to a person having ordinary skill in the art to have used the edge enhancement parameters with the appropriate photographing conditions to improve the dynamic range of the captured image. Although the Serizawa reference does not expressly teach a limit setting value to improve the edge enhancement processing, a person having ordinary skill in the art would have known to adjust the gain and limit setting parameters to improve and manipulate edge enhancement processing to obtain desired results. (See col. 1, lines 32-35 of Serizawa et al.)

As to claims 4 and 6, Kato teaches wherein the range finding sensor includes a first range lens arranged parallel to an optical axis (lens 17), and a second range lens (lens 16) arranged parallel to the optical axis on an opposite side of the optical axis from the first range lens (See Fig. 1, col. 2, lines 55-64).

As to claims 5 and 7, Kato teaches wherein the range finding sensor includes a first photo sensor array (photoconductive element 32) configured to receive a first image via the first range lens, and a second photo sensor array (photoconductive element 31) configured to receive a second image via the second range lens, wherein a range finding information arithmetic unit (distance detecting circuit 70) is configured to calculate an object distance based on a difference in data obtained by the first and second photo sensor arrays (col. 2, lines 60-62, col. 4, line 55-col. 5, line 12).

5. Claims 3, 8, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morimoto (US 6,453,124) in view of Kato (US 4,156,563), further in view of Malkin et al. (US 6,614,474 B1).

As to claim 3, Morimoto teaches, in figure 1, a digital camera comprising:

- a range finding sensor to measure a distance to an object (distance-measuring sensor 15);
- an imaging device configured to receive an image of the object (image sensor 8);
- a focus lens configured to image the image of the object on the imaging device (taking lens 4);
- a first focusing system of obtaining a focusing position by sampling a contrast of an object image formed on a light receiving surface with moving a focus lens along an optical axis (contrast AF method; col. 15, lines 22-31);

- a second focusing system of obtaining the focusing position by measuring a distance to an object based on a triangular surveying system (phase difference AF; col. 5, lines 27-36);
- a selection device configured to select that one of the first focusing system and the second focusing system is operative or that both of the first and second focusing systems are operative together (menu setting AF selection, state S12; flowchart Fig. 7),
- wherein the first focusing system is configured to detect the focusing position by means of the imaging device (image capture or three successive frames are done by the image sensor 8; col. 13, lines 41-46),
- wherein the second focusing system is configured to detect the focusing position by means of the range finding sensor (col. 5, lines 22-31);

but does not teach:

- wherein the second focusing system obtains the focusing position by measuring a distance to an object with the range finding sensor based on a triangular surveying system without using the focus lens;
- an edge enhancement processing device including a digital filter configured to enhance an edge component of an image signal of a photographed image obtained by photographing said object; and
- a system control unit having a first level conversion characteristic in which a setting value of a digital filter is set and a second level conversion characteristic in which a setting value of the digital filter having a characteristic which enhances a high

frequency component than the setting value of the digital filter of the first level conversation characteristic is set, and

- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized.

Kato teaches wherein:

- a focusing system (Fig. 1) obtains the focusing position by measuring a distance to an object with the range finding sensor based on a triangular surveying system without using the focus lens (Kato detects focus using lenses 16 and 17 instead of main lens 24).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the focusing system of Kato with the second focusing system of Morimoto in order to provide a focusing system that can overcome the difficulties of low contrast and complex scenes. (See col. 1, lines 24-30 and col. 2, lines 14-34 of Kato.)

Kato does not teach:

- an edge enhancement processing device configured to emphasize an edge component of an image signal of a photographed image obtained by photographing said object;
- a system control unit having a first level conversion characteristic in which a predetermined gain setting value is set and a second level conversion characteristic in which a gain setting value larger than the gain setting value of the first level conversion characteristic is set,
- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement processing device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized.

Malkin et al. teaches:

- an edge enhancement processing device (300) including a digital filter configured to enhance an edge component of an image signal of a photographed image obtained by photographing said object; and
- a system control unit (HLUT 210h) having a first level conversion characteristic in which a setting value of a digital filter is set and a second level conversion characteristic in which a setting value of the digital filter having a characteristic which

enhances a high frequency component than the setting value of the digital filter of the first level conversation characteristic is set (a lookup table containing a plurality of coefficients for digital filters; col. 5, lines 15-19), and

- wherein the system control unit sends the first level conversion characteristic to the edge enhancement processing device when the first focusing system is selected to be operative independently by the selection device, or the first and the second focusing systems are selected to be operative together by the selection device, and sends the second level conversion characteristic to the edge enhancement device when the second focusing system is selected to be operative independently by the selection device, so that the edge component is emphasized. (Coefficients of the digital filter are adjusted according to the mode of the camera, i.e., zoom ratio, and at high zoom ratios, the filter coefficients have a sleeper slope than at a low zoom ratio. See col. 4, line 66-col. 5, line 14.)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the digital filter edge enhancement processing device of Malkin with the hybrid-focus digital camera of Morimoto to provide an adaptive edge sharpening apparatus and method which sharpens an image without significantly amplifying noise. Malkin teaches the adaptation of an edge enhancement process during different conditions of photography. It would have been obvious to a person having ordinary skill in the art to have used the edge enhancement digital filter parameters with the appropriate photographing conditions (including autofocusing

conditions) to improve the edge enhancement while maintaining an image with low noise. (See col. 2, lines 4-6 of Malkin et al.)

As to claim 8, Kato teaches wherein the range finding sensor includes a first range lens arranged parallel to an optical axis (lens 17), and a second range lens (lens 16) arranged parallel to the optical axis on an opposite side of the optical axis from the first range lens (See Fig. 1, col. 2, lines 55-64).

As to claim 9, Kato teaches wherein the range finding sensor includes a first photo sensor array (photoconductive element 32) configured to receive a first image via the first range lens, and a second photo sensor array (photoconductive element 31) configured to receive a second image via the second range lens, wherein a range finding information arithmetic unit (distance detecting circuit 70) is configured to calculate an object distance based on a difference in data obtained by the first and second photo sensor arrays (col. 2, lines 60-62, col. 4, line 55-col. 5, line 12).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHIA-WEI A. CHEN whose telephone number is (571)270-1707. The examiner can normally be reached on Monday - Friday, 7:30 - 17:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan V Ho/
Primary Examiner, Art Unit 2622

/C. A. C./
Examiner, Art Unit 2622